

REPLACED BY  
ART 34 ANDT

What Is Claimed Is:

1. An amphibious vehicle having armoured inflatable floating devices (AFIFDs) for providing additional buoyancy during swimming, which are mounted on both outer sides thereof, the amphibious vehicle comprising:

at least one wall closet-type connecting room corresponding to at least one connector protruding from a side of the AFIFD, which contacts the amphibious vehicle to have the amphibious vehicle and the AFIFD connected each other, the wall closet-type connecting room and the connector of the AFIFD forming a sealed space by being correspondingly connected to the connectors of the AFIFD, the wall closet-type connecting room being sunken inwardly from the outer side surface of the amphibious vehicle and being a corresponding area of the amphibious vehicle for installing a driving means for carrying out folding and unfolding actions of the AFIFD, so that the wall closet-type connecting room is closed at the upper and lower sides, the right and left sides and the inner side thereof and opened at the outer side thereof.

2. The amphibious vehicle according to claim 1, wherein the inner side of the wall closet-type connecting room is made of sectional plates having sealing means.

3. The amphibious vehicle according to claim 1 or 2, wherein the inner side of the wall closet-type connecting room further includes a transparent window and an illuminating device.

4. The amphibious vehicle according to claim 1 or 2, wherein the inner side of the wall closet-type connecting room further includes a periscope and an illuminating device.

5. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate forming a first side surface of the AFIFD;

an upper armor plate connected to the upper end of the inner plate by hinges to form the top surface of the AFIFD;

an outer armor plate connected to the upper armor plate by hinges to form a second side surface of the AFIFD;

a lower armor plate connected to the lower end of the inner plate and the outer armor plate by hinges to form the bottom surface of the AFIFD;

a seal membrane for sealing gaps between two plates of the inner plate, the upper armor plate, the outer armor plate and the lower armor plate, the two plates being in contact with each other;

front and rear thimble-type rubber membranes respectively located on the front and rear parts of the AFIFD, wherein the outer circumferences surrounding the ends of the thimble-type rubber membranes are bonded to corresponding parts of the inner plate, the upper armor plate, the outer armor plate and the lower armor plate;

at least one connector mounted on the inner plate to provide air to the AFIFD;

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear thimble-type rubber membranes, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD; and

at least one driving means mounted between the upper armor plate and a corresponding part of the amphibious vehicle, the driving means carrying out folding and unfolding actions of the AFIFD,

wherein, when the amphibious vehicle swims in water, the upper armor plate, the outer armor plate and the lower armor plate are completely unfolded by the driving means and pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the inner plate, the upper armor plate, the outer armor plate, the lower armor plate, and the front and rear thimble-type rubber membranes,

wherein, when the amphibious vehicle does not swim in water, the upper armor plate, the outer armor plate and the lower armor plate are folded to the inner plate by the driving means and air suction and fixed by fixing means, and then the front and rear armor plates are closely folded and fixed to the folded upper armor plate, and

wherein the AFIFD can be lifted up by the driving means after the fixing means fixing

the inner plate of the AFIFD to the outer side of the amphibious vehicle are unfastened.

6. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

- an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate forming a first side surface of the AFIFD;

- an upper armor plate connected to the upper end of the inner plate by hinges to form the top surface of the AFIFD;

- an outer armor plate connected to the upper armor plate by hinges to form a second side surface of the AFIFD;

- a lower armor plate connected to the lower end of the inner plate and the outer armor plate by hinges to form the bottom surface of the AFIFD;

- a rubber membrane bag having a sealed space which has a shape and a size suitable for the inner shape of the unfolded armor plates and at least one connector for providing air to the sealed space, the rubber membrane bag being partially bonded to main points of the armor plates to allow the folding and unfolding action of the AFIFD;

- front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear parts of the rubber membrane bag, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD; and

- at least one driving means mounted on the upper armor plate, the driving means carrying out folding and unfolding actions of the AFIFD,

wherein, when the amphibious vehicle swims in water, the upper armor plate, the outer armor plate and the lower armor plate are completely unfolded by the driving means and pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the rubber membrane bag,

wherein, when the amphibious vehicle does not swim in water, the upper armor plate, the outer armor plate and the lower armor plate together with the rubber membrane bag, from which the air is deflated, are folded to the inner plate by the driving means and air suction and fixed by fixing means, and then the front and rear armor plates are closely folded and fixed to the folded upper armor plate, and

wherein the AFIFD can be lifted up by the driving means after the fixing means fixing the inner plate of the AFIFD to the outer side of the amphibious vehicle are unfastened.

7. The AFIFD according to claim 5 or 6, wherein the lower armor plate is made of multiple strips longitudinally elongated and hinged with each other in a bendable manner.

8. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

- an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate forming a first side surface of the AFIFD;

- an upper armor plate connected to the upper end of the inner plate by hinges to form the top surface of the AFIFD;

- an outer armor plate connected to the upper armor plate by hinges to form a second side surface of the AFIFD;

- front and rear thimble-type rubber membranes respectively located on the front and rear parts of the AFIFD, wherein the outer circumferences surrounding the ends of the thimble-type rubber membranes are bonded with corresponding parts of the inner plate, the upper armor plate and the outer armor plate;

- a lower rubber membrane bonded with the lower end of the front thimble-type rubber membrane, the lower end of the rear thimble-type rubber membrane, the lower end of the inner plate and the lower end of the outer plate;

- a seal membrane for sealing gaps between two plates of the inner plate, the upper armor plate and the outer armor plate, the two plates being contacted with each other;

- at least one connector mounted on the inner plate to provide air to the AFIFD;

- front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear thimble-type rubber membranes, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD; and

- at least one driving means mounted on the upper armor plate, the driving means carrying out folding and unfolding actions of the AFIFD,

- wherein, when the amphibious vehicle swims in water, the upper armor plate and the

outer armor plate are completely unfolded by the driving means and pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the inner plate, the upper armor plate, the outer armor plate, the front and rear thimble-type rubber membranes and the lower rubber membrane, and

wherein, when the amphibious vehicle does not swim in water, the upper armor plate, the outer armor plate, the front and rear thimble-type rubber membranes and the lower rubber membrane are folded to the inner plate by the driving means and air suction and fixed by fixing means, and then the front and rear armor plates are closely folded and fixed to the folded upper armor plate,

wherein the AFIFD can be lifted up by the driving means after the fixing means fixing the inner plate of the AFIFD to the outer side of the amphibious vehicle are unfastened.

9. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate forming a first side surface of the AFIFD;

an upper armor plate connected to the upper end of the inner plate by hinges to form the top surface of the AFIFD;

an outer armor plate connected to the upper armor plate by hinges to form a second side surface of the AFIFD;

a rubber membrane bag having a sealed space which has a shape and a size suitable for the inner shape of the unfolded armor plates and at least one connector for providing air to the sealed space, the rubber membrane bag being partially bonded to main points of the armor plates to allow the folding and unfolding actions of the AFIFD;

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear parts of the rubber membrane bag, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD; and

at least one driving means mounted on the upper armor plate, the driving means carrying out folding and unfolding actions of the AFIFD,

wherein, when the amphibious vehicle swims in water, the upper armor plate and the

outer armor plate are completely unfolded by the driving means and pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the rubber membrane bag, and

wherein, when the amphibious vehicle does not swim in water, the upper armor plate and the outer armor plate together with the rubber membrane bag, from which the air is deflated, are folded to the inner plate by the driving means and air suction and fixed by fixing means, and then the front and rear armor plates are closely folded and fixed to the folded upper armor plate,

wherein the AFIFD can be lifted up by the driving means after the fixing means fixing the inner plate of the AFIFD to the outer side of the amphibious vehicle are unfastened.

10. The AFIFD according to any one of claims 7 to 9, wherein the outer armor plate is made of multiple strips longitudinally elongated and hinged with each other in a bendable manner.

11. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate forming a first side surface of the AFIFD;

an upper armor plate connected to the upper end of the inner plate by hinges to form the top surface of the AFIFD;

an outer armor plate connected to the upper armor plate by hinges, the outer armor plate being located on the outside of the upper armor plate when the AFIFD is folded, the outer armor plate forming a second side surface for protecting an outer rubber membrane when the AFIFD is unfolded;

a seal membrane for sealing between the inner plate and the upper armor plate being in contact with each other;

rubber membranes integrally forming the front, rear, lower and outer surfaces of the AFIFD, of which portions contacting the inner plate and the upper armor plate are bonded with the armor plates respectively;

at least one connector mounted on the inner plate to provide air to the AFIFD;

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear thimble-type rubber membranes, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD;

at least one driving means mounted on the upper armor plate, the driving means carrying out folding and unfolding actions of the AFIFD; and

at least one means for controlling the folding and unfolding actions of the outer armor plate of the AFIFD, the means connecting the upper end edge of the outside of the inner plate and the lower end of the outside of the outer armor plate,

wherein, when the amphibious vehicle swims in water, the upper armor plate and the front, rear, lower and outer rubber membranes are completely unfolded by the driving means and pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the inner plate, the upper armor plate and the front, rear, lower and outer rubber membranes and the floating space is protected by the front and rear armor plates and the outer armor plate, and

wherein, when the amphibious vehicle does not swim in water, the upper armor plate and the front, rear, lower and outer rubber membranes are folded to the inner plate by the driving means and air suction and fixed by fixing means, and then the outer armor plates are closely folded and fixed to the folded upper armor plate, and the front and rear armor plates are closely folded and fixed to the folded outer armor plate,

wherein the AFIFD can be lifted up by the driving means after the fixing means fixing the inner plate of the AFIFD to the outer side of the amphibious vehicle are unfastened.

12. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate forming a first side surface of the AFIFD;

an upper armor plate connected to the upper end of the inner plate by hinges to form the top surface of the AFIFD;

an outer armor plate connected to the upper armor plate by hinges, the outer armor plate being located on the outside of the upper armor plate when the AFIFD is folded, the

outer armor plate forming a second side surface for protecting an outer rubber membrane when the AFIFD is unfolded;

a rubber membrane bag having a sealed space which has a shape and a size suitable for the inner shape of the unfolded armor plates and at least one connector for providing air to the sealed space, the rubber membrane bag being partially bonded to main points of the armor plates to allow the folding and unfolding actions of the AFIFD;

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear parts of the rubber membrane bag, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD;

at least one driving means mounted on the upper armor plate, the driving means carrying out folding and unfolding actions of the AFIFD; and

at least one means for controlling the folding and unfolding actions of the outer armor plate of the AFIFD, the means connecting the upper end edge of the outside of the inner plate and the lower end of the outside of the outer armor plate,

wherein, when the amphibious vehicle swims in water, the upper armor plate and the outer armor plate are completely unfolded by the driving means and pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the rubber membrane bag, and the sealed floating space is protected by the upper armor plate, the front and rear armor plates, and the outer armor plate, and

wherein, when the amphibious vehicle does not swim in water, the upper armor plate and the rubber membrane bag, from which the air is deflated, are folded to the inner plate by the driving means and air suction and fixed by fixing means, and then the outer armor plate is closely folded and fixed to the outer surface of the folded upper armor plate, and the front and rear armor plates are closely folded and fixed to the folded outer armor plate,

wherein the AFIFD can be lifted up by the driving means after the fixing means fixing the inner plate of the AFIFD to the outer side of the amphibious vehicle are unfastened.

13. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one



hinge and fixing means, the inner plate forming a first side surface of the AFIFD;

an upper armor plate connected to the upper end of the inner plate by hinges, the upper armor plate serving both as the top surface and the outer surface of the AFIFD by being slantedly unfolded;

a seal membrane for sealing between the inner plate and the upper armor plate being in contact with each other;

rubber membranes integrally forming the front, rear and lower surfaces of the AFIFD, in which portions contacting the inner plate and the upper armor plate are bonded with the armor plates respectively;

at least one connector mounted on the inner plate to provide air to the AFIFD;

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear surfaces of the rubber membranes, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD; and

at least one driving means mounted on the upper armor plate, the driving means carrying out folding and unfolding actions of the AFIFD,

wherein, when the amphibious vehicle swims in water, the upper armor plate is slantedly unfolded in a downward direction by the driving means and pneumatic pressure, so that the inner plate and the front, rear and lower rubber membranes form a sealed floating space inside the AFIFD, and

wherein, when the amphibious vehicle does not swim in water, the front, rear and lower rubber membranes integrally formed are folded between the inner plate and the upper armor plate by the driving means and air suction and fixed by fixing means, and then the front and rear armor plates are closely folded and fixed to the folded upper armor plate,

wherein the AFIFD can be lifted up by the driving means after the fixing means fixing the inner plate of the AFIFD to the outer side of the amphibious vehicle are unfastened.

14. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate forming a first side surface of the AFIFD;

an upper armor plate connected to the upper end of the inner plate by hinges, the upper armor plate serving both as the top surface and the outer surface of the AFIFD by being slantedly unfolded;

a rubber membrane bag having a sealed space which has a shape and a size suitable for the inner shape of the unfolded armor plates and at least one connector for providing air to the sealed space, the rubber membrane bag being partially bonded to main points of the armor plates to allow the folding and unfolding actions of the AFIFD;

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear parts of the rubber membrane bag, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD; and

at least one driving means mounted on the upper armor plate, the driving means carrying out folding and unfolding actions of the AFIFD,

wherein, when the amphibious vehicle swims in water, the upper armor plate is slantedly unfolded in a downward direction by the driving means and pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the rubber membrane bag, and

wherein, when the amphibious vehicle does not swim in water, the rubber membrane bag, from which the air is deflated, is folded between the inner plate and the upper armor plate by the driving means and air suction and fixed by fixing means, and then the front and rear armor plates are closely folded and fixed to the folded upper armor plate,

wherein the AFIFD can be lifted up by the driving means after the fixing means fixing the inner plate of the AFIFD to the outer side of the amphibious vehicle are unfastened.

15. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate forming a first side surface of the AFIFD;

an upper armor plate connected to the upper end protrusion of the inner plate by hinges to form the top surface of the AFIFD, the upper armor plate being made of two pairs or more of plates in even numbers, the pairs of the plates being connected with each other by hinges and folded and unfolded in the form of a zigzag;

an outer armor plate having an upper end protrusion connected to the upper armor plate by hinges to form a second side surface of the AFIFD;

a lower armor plate connected to the lower end protrusion of the inner plate and the lower end protrusion of the outer armor plate by hinges to form the lower surface of the AFIFD, the lower armor plate being made of two pairs or more of plates in even numbers, the pairs of the plates being connected with each other by hinges and folded and unfolded in the form of a zigzag;

front and rear thimble-type rubber membranes respectively located on the front and rear parts of the AFIFD, wherein the outer circumferences surrounding the ends of the thimble-type rubber membranes are bonded with corresponding parts of the inner plate, the upper armor plate, the outer armor plate and the lower armor plate;

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear thimble-type rubber membranes, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD; and

at least one connector mounted on the inner plate to provide air to the AFIFD,

wherein, when the amphibious vehicle swims in water, the upper armor plate, the outer armor plate and the lower armor plate are completely unfolded by pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the inner plate, the upper armor plate, the outer armor plate, the lower armor plate, and the front and rear thimble-type rubber membranes, and

wherein, when the amphibious vehicle does not swim in water, the plates of the upper armor plate and the lower armor plate connected by the hinges are folded by air suction, with facing the plates of the upper armor plate and the lower armor plate each other.

16. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate being a first side surface of the AFIFD;

an upper armor plate connected to the upper end protrusion of the inner plate by hinges to form the top surface of the AFIFD, the upper armor plate being made of two pairs or more

of plates in even numbers, the pairs of the plates being connected with each other by hinges and folded and unfolded in the form of a zigzag;

an outer armor plate having an upper end protrusion connected to the upper armor plate by hinges to form a second side surface of the AFIFD;

a lower armor plate connected to the lower end protrusion of the inner plate and the lower end protrusion of the outer armor plate by hinges to form the bottom surface of the AFIFD, the lower armor plate being made of two pairs or more of plates in even numbers, the pairs of the plates being connected with each other by hinges and folded and unfolded in the form of a zigzag;

a rubber membrane bag having a sealed space which has a shape and a size suitable for the inner shape of the unfolded armor plates and at least one connector for providing air to the sealed space, the rubber membrane bag being partially bonded to main points of the armor plates to allow the folding and unfolding action of the AFIFD; and

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear parts of the rubber membrane bag, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD,

wherein, when the amphibious vehicle swims in water, the upper armor plate, the outer armor plate and the lower armor plate are completely unfolded by pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the rubber membrane bag, and

wherein, when the amphibious vehicle does not swim in water, the plates of the upper armor plate and the lower armor plate connected by the hinges are folded by the rubber membrane bag, from which the air is deflated by air suction, with facing the plates of the upper armor plate and the lower armor plate each other.

17. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate being a first side surface of the AFIFD;

an upper armor plate connected to the upper end protrusion of the inner plate by hinges to form the top surface of the AFIFD, the upper armor plate being made of two pairs or more

of plates in even numbers, the pairs of the plates being connected with each other by hinges and folded and unfolded in the form of a zigzag;

an outer armor plate having an upper end protrusion connected to the upper armor plate by hinges to form a second side surface of the AFIFD;

at least one frame connected to the lower end protrusion of the inner plate and the lower end protrusion of the outer armor plate by hinges to form the bottom surface of the AFIFD, the frame being hinged with each other and folded and unfolded in the form of a zigzag;

front and rear thimble-type rubber membranes respectively located on the front and rear parts of the AFIFD, wherein the outer circumferences surrounding the ends of the thimble-type rubber membranes are bonded with corresponding parts of the inner plate, the upper armor plate, the outer armor plate and the lower armor plate;

a lower rubber membrane bonded with the lower end of the front thimble-type rubber membrane, the lower end of the rear thimble-type rubber membrane, the lower end of the inner plate and the lower end of the outer plate;

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear thimble-type rubber membranes, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD; and

at least one connector mounted on the inner plate to provide air to the AFIFD,

wherein, when the amphibious vehicle swims in water, the upper armor plate, the outer armor plate and the frame are completely unfolded by the driving means and pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the inner plate, the upper armor plate, the outer armor plate, the lower rubber membrane, and the front and rear thimble-type rubber membranes, and

wherein, when the amphibious vehicle does not swim in water, the plates of the upper armor plate and the frame connected by the hinges are folded by air suction, with facing the plates of the upper armor plate and the frame each other.

18. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate being a first side surface of the AFIFD;

an upper armor plate connected to the upper end protrusion of the inner plate by hinges to form the top surface of the AFIFD, the upper armor plate being made of two pairs or more of plates in even numbers, the pairs of the plates being connected with each other by hinges and folded and unfolded in the form of a zigzag;

an outer armor plate having an upper end protrusion connected to the upper armor plate by hinges to form a second side surface of the AFIFD;

at least one frame connected to the lower end protrusion of the inner plate and the lower end protrusion of the outer armor plate by hinges to form the bottom surface of the AFIFD, the frame being hinged with each other and folded and unfolded in the form of a zigzag;

a rubber membrane bag having a sealed space which has a shape and a size suitable for the inner shape of the unfold armor plates and at least one connector for providing air to the sealed space, the rubber membrane bag being partially bonded to main points of the armor plates to allow the folding and unfolding actions of the AFIFD; and

front and rear armor plates respectively connected to both ends of the inner plate by hinges for protecting the front and rear parts of the rubber membrane bag, the front and rear armor plates respectively forming the front and rear surfaces of the AFIFD,

wherein, when the amphibious vehicle swims in water, the upper armor plate, the outer armor plate and the frame are completely unfolded by the driving means and pneumatic pressure, so that a sealed floating space is formed inside the AFIFD by the rubber membrane bag, and

wherein, when the amphibious vehicle does not swim in water, the frame and the plates of the upper armor plate connected by the hinges are folded in a line by air suction.

19. The AFIFD according to any one of claims 5 to 10, wherein at least one means for controlling one or more ropes connected to the lower end of the outer armor plate is additionally mounted at the corresponding connected portion of the amphibious vehicle.

20. The AFIFD according to any one of claims 5 to 14 and 19, wherein the connector is an extensible connector, and both ends of the driving means are respectively mounted on the corresponding connected portion of the amphibious vehicle and the upper armor plate through the extensible connector.

21. An AFIFD mounted on an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

- an inner plate attached to the outer side of the amphibious vehicle through at least one hinge and fixing means, the inner plate being a first side surface of the AFIFD;

- an upper armor plate connected to the upper end of the inner plate by hinges;

- an outer armor plate connected to the upper armor plate by hinges;

- air bag having a sealed space which has a shape and a size suitable for the inner shape of the unfold protected plates, the air bag being partially bonded to main points of the armor plates, so that the air bag can be folded and unfolded together with the armor plates;

- front and rear armor plates respectively connected to right and left ends of the inner plate by hinges for protecting the front and rear surfaces of the AFIFD; and

- at least one driving means mounted between the outer side of the amphibious vehicle and the corresponding portion of the upper armor plate, the driving means allowing the folding and unfolding actions of the AFIFD,

- wherein, when the amphibious vehicle swims in water, the upper and outer armor plates are completely unfolded, so that a sealed floating space is formed inside the AFIFD by the air bag, and

- wherein, when the amphibious vehicle does not swim in water, the upper and outer armor plates together with the air bag are folded and fixed to the inner plate.

22. The AFIFD according to claim 21, wherein a portion of the outer armor plate, which corresponds to a location of the upper armor plate to which the driving means is attached in case that the outer armor plate is folded to the upper armor plate, is cut to prevent interference between the outer armor plate and the driving means when the outer armor plate is folded to the inner plate, and

wherein the AFIFD further comprises means for securing a space of the driving means by partially moving the air bag as the outer armor plate is folded, in order to secure the space of the driving means and to prevent interference between the driving means and the air bag when the outer armor plate is folded to the inner plate.

23. The AFIFD according to claim 21 or 22, wherein the means for securing a space of the driving means includes:

ropes for connecting right and left sides of the cut portion of the outer armor plate to the inner plate, respectively, each rope having ring formed on the end connected with the outer armor plate; and

rope connecting members located at right and left sides of the cut portion of the outer armor plate, the rope connecting members allowing the rings to slide in direction that the rings becomes closer to the cut portion along the surface of the outer armor plate,

wherein the rings slide to the cut portion of the outer armor plate as the outer armor plate is folded, so that a portion of the air bag around the cut portion is pulled toward the cut portion so as to secure the space for the driving means.

24. The AFIFD according to claim 21 or 22, further comprising a fabric membrane for restricting the unfolded width of the outer armor plate, such that the outer armor plate is at a right angle to the upper armor plate when the AFIFD is unfolded, one side of the fabric membrane being connected with the lower end of the outer armor plate, and the opposing side being connected with the lower end of the inner plate.

25. The AFIFD according to claim 24, wherein the fabric membrane has a fabric hardening portion having a property that the fabric hardening portion is not bended or broken in free condition to prevent the fabric membrane and the air bag from being inserted into gaps of the AFIFD.

26. The AFIFD according to claim 21, further comprising: at least one rope for connecting the lower end of the outer armor plate and the lower end of the inner plate, the



ropes being mounted at a certain interval along the longitudinal direction of the AFIFD, the ropes restricting the unfolded width of the outer armor plate, such that the outer armor plate is at a right angle to the upper armor plate when the AFIFD is unfolded.

27. The AFIFD according to any one of claims 21 to 26, further comprising: fabric bands mounted on the front and rear portions of the air bag corresponding to the front and rear surface of the AFIFD to prevent the front and rear portions of the air bag from protruding to the outside of the AFIFD by the inner air pressure of the air bag when the AFIFD is unfolded.

28. An AFIFD mounted on the front surface of an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD comprising:

- a front armor plate having a lower end edge hinged to a nose portion of the front surface;

- an upper armor plate hinged to an edge protruding in the form of an "L" shape on the upper end of the front armor plate;

- an air bag inserted in a space between the front armor plate and the upper armor plate; inverted triangle-type left and right armor plates respectively hinged with protrusions on the left and right sides of the front armor plate, the protrusions being more protruding than the protruding edge of the upper end of the front armor plate;

- an driving means for operating the front armor plate;

- an upper armor plate driving means mounted inside the air bag, the driving means having both ends mounted on the central and lower end of the front armor plate and the central and upper end of the upper armor plate; and

- at least one side plate driving means mounted on each side to operate the left and right armor plates.

29. A method for operating an AFIFD mounted on the front surface of an amphibious vehicle for providing additional buoyancy to the amphibious vehicle, the AFIFD including a front armor plate, an upper armor plate, left and right side armor plates, air bag located in the armor plates, and driving means for respectively operating the armor plates,

wherein, when the amphibious vehicle runs on ground, the AFIFD being closely contacted to the upper portion of the front surface of the amphibious vehicle,

wherein, when the amphibious vehicle swims in water, the method comprising the steps of:

rotating forwardly on a hinge of a nose portion of the amphibious vehicle and moving to an inclined location by a front armor plate driving means;

rotating and vertically standing the right and left armor plates by the side plate driving means;

expanding the air bag by unfolding the upper armor plate upwardly by the driving means and providing air into the air bag; and

pulling the front armor plate driving means toward the amphibious vehicle to reach the upper portion of the front surface of the amphibious vehicle, the end of the upper armor plate and the ends of the right and left armor plates with one another, so that the front, upper, right and left surfaces of the air bag inside the AFIFD can be protected by the front armor plate, the upper armor plate and the right and left armor plates, and the rear surface of the air bag can be protected by the upper portion of the front surface of the amphibious vehicle.